

Appl. No. 10/527,182
Response to Office Action mailed July 27, 2006

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REMARKS

With respect to the Notice of References Cited (Form PTO-892), which is attached at the end of the Office Action, it is noted that "JP 05-253207" should be -JP 05-263207--. JP 05-263207 (as well as the other two JP publications cited on the Form PTO-892) was cited in the INFORMATION DISCLOSURE STATEMENT BY APPLICANT PTO/SB/08A dated March 7, 2005 in the above-identified application.

Claims 1 and 3 to 16 were editorially revised.

The feature added to claims 3 and 8 regarding Fe and inevitable impurities is supported in the specification on page 25, last two lines.

New claim 17 is supported by the paragraph bridging pages 23 and 24 of the specification.

New claim 18 is supported on pages 24 and 25 of the specification.

The present claim 1 is directed to a galvanized steel sheet, having an excellent coating adhesion, comprising an interface between a galvanized layer and a base steel sheet on which the galvanized layer is formed, an irregularity that has

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a depth of 10 nm or more at a pitch of 0.5 μm or less is present at least one per 5 μm of the length of the interface.

Claims 1, 3 to 5 and 7 were rejected under 35 USC 102 as anticipated by or, in the alternative, under 35 USC 103 as obvious over Masahiko et al. (JP 2001-303226) for the reasons set forth on pages 2 to 4 of the Office Action.

It was admitted in the Office Action that Masahiko et al. is silent regarding the depth, pitch or length of the irregularities.

With respect to applicants' claim 5, it was also admitted in the Office Action that Masahiko et al. do not disclose a silicon oxide formed immediately below the steel surface.

Masahiko et al. do not disclose the following important feature of applicants' claim 1: "in an interface between a galvanized layer and a base steel sheet on which the galvanized layer is formed, an irregularity that has a depth of 10 nm or more at a pitch of 0.5 μm or less is present at least one per 5 μm of a length of the interface."

In Masahiko et al., there is no teaching or suggestion of a shape (irregularity) of an interface between a galvanized layer and a base steel sheet. Moreover, it is respectfully submitted that one of ordinary skill in the art would not have gleaned the

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above-mentioned important feature of applicants' claim 1 from the disclosure of Masahiko et al.

The sentence bridging pages 2 and 3 of the Office Action mentioned paragraph [0017] and Fig. 1 in Masahiko et al. refer to "a Γ 1 phase grows in a needle-like shape over a Γ phase." This means that a Γ 1 phase grows in a needle-like shape (irregular shape) over a Γ phase.

Applicants' claim 1, which recites a shape of an interface between a galvanized layer (a Γ phase corresponding to reference numeral 3 in Fig. 1 of Masahiko et al.) and a base steel sheet (corresponding to the reference numeral 3 in Fig. 1 of Masahiko et al) is not taught or suggested in Masahiko et al.

Further, in Masahiko et al., the following features of applicants' claim 4 are not disclosed: "in a stage immediately before a coating layer is adhered to the base steel sheet, in order that is contained in the base steel sheet is not selectively oxidized on a surface, the base steel sheet is heat treated before the coating layer is adhered."

Moreover, in Masahiko et al., the following feature of applicants' claim 5 is not disclosed: "an oxide of silicon being contained in a base steel sheet immediately below the interface."

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Masahiko et al. absolutely do not disclose or suggest Si contained in a steel sheet in a stage immediately before a coating layer is adhered. It is respectfully submitted that one of ordinary skill in the art would therefore not arrive at applicants' claim 4 from the disclosure in Masahiko et al.

Paragraph [0047] of Masahiko et al. is referred to in the Office Action. Paragraph [0027] of Masahiko et al. concerns a steel sheet that is subjected to preliminary heating for oxidation to form iron oxide on the surface of a steel sheet and forming reduced iron on the surface by subsequent reducing annealing, but this does not indicate a state of Si.

The aforesaid important features of applicants' claim 1 serves to achieve the following advantageous results:

- (1) By prescribing a shape of an interface between a galvanized layer and a base steel sheet, an excellent tensile shear strength and a peeling mode by an adhesive agent can be secured, as shown in Table 2-1 on page 42 of the present specification.
- (2) By prescribing a shape of an interface between a galvanized layer and a base steel sheet, excellent adhesion of the coating layer during a

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bending-unbending operation can be obtained, as shown in Table 4-1 on page 49 of the present specification and Table 6-1 on page 56 of the present specification.

Claims 1 and 3 to 7 were rejected under 35 USC 102 as anticipated by or, in the alternative, under 35 USC 103 as obvious over Yoshitsugu et al. (JP 2000-290730) for the reasons stated on pages 4 to 5 of the Office Action.

It was admitted in the Office Action that Yoshitsugu et al. are silent regarding the formation of irregular portions or the depth, pitch and length of the irregularities.

Yoshitsugu et al. do not disclose the following features of applicants' claim 1: "in an interface between a galvanized layer and a base steel sheet on which the galvanized layer is formed, an irregularity that has a depth of 10 nm or more at a pitch of 0.5 μ m or less is present at least one per 5 μ m of a length of the interface."

In Yoshitsugu et al., a content defining a shape (irregularity) of an interface between a galvanized layer and a base layer and a base steel sheet is not disclosed at all. It is respectfully submitted that one of ordinary skill in the art

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would not arrive at the above-mentioned important feature of the present claims from the disclosure of Yoshitsugu et al.

As stated above, the important features of applicants' claim 1 achieve the following advantageous results:

- (1) By prescribing a shape of an interface between a galvanized layer and a base steel sheet, excellent tensile shear strength and peeling mode by an adhesive agent can be secured, as shown in Table 2-1 of page 42 of the present specification.
- (2) By prescribing a shape of an interface between a galvanized layer and a base steel sheet, an excellent adhesion of the coating layer during a bending-unbending operation can be obtained, as shown in Table 4-1 and Table 6-1 on pages 49 and 56, respectively, of the present specification.

It is therefore respectfully submitted that applicants' claimed invention is not anticipated and is not rendered obvious by each of the references. Withdrawal of both of the prior art rejections is thus respectfully requested.

Reconsideration is requested. Allowance is solicited.

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If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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